Consumers Power
POWERING MICHIGAN'S PROGRESS
Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

G B Slade
General Manager

February 14, 1992

Director, Office of Enforcement
Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT - REPLY TO NOTICE OF VIOLATION DATED JANUARY 15, 1992

By letter dated January 15, 1992, Consumers Power Company was notified of violations resulting from inspections conducted from September 19, 1990, through April 18, 1991 and June 10 through June 21, 1991. The inspections focused on areas of design engineering, field implementation and testing activities associated with the Palisades Steam Generator Replacement Project (SGRP) as well as other plant modifications. The violations consisted of examples of design control deficiencies in calculations and specifications associated with pipe and pipe supports as well as other areas associated with SGRP. Each of the violations is responded to in the attachment to this letter.

In addition to responding to the violations, this letter provides a short background of inspections related to design control issues in the pipe and pipe support areas, a discussion of contractor control that addresses the NRC's concerns identified in the January 15, 1992 letter, and recent discrepancies that were identified during our main steam line reanalysis (we had committed to reanalyze the main steam line in our July 9, 1991 letter).

BACKGROUND

The topic of engineering and design control has been the subject of many inspections and discussions with the NRC since 1989. These inspections have resulted in many procedural and programatic upgrades in the area of engineering and design control. Summary discussions of the NRC's inspection reports 89-007 (special team inspection relative to design basis reconstitution dated June 28, 1989), 89-024 (inspection of the snubber reduction program dated January 4, 1990), 90-025 (inspection of activities related to the SGRP dated May 24, 1991) and 91-202 (a special team inspection of plant modifications and design control requirements dated August 2, 1991) are provided below.

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NRC Inspection Report 89-007 presented the results of an engineering team inspection conducted from April 3 through May 5, 1989. Problems in the areas of personnel performance, design change control procedure weaknesses and a general welding engineering and program control weakness. Our response to these problems included: emphasizing management expectations of performance level with the engineers, upgrading the design change process, clarifying some of our engineering specifications, and modifying the welding program to assure that welding requirements were folded into the design process.

NRC Inspection Report 89-024 presented the results of the snubber reduction inspection conducted from August 14 through December 7, 1989. The report pointed out extensive problems with the documentation of the plant's IE Bulletin (IEB) 79-14 project documentation which eventually led to our commitment to reconcile the entire IEB 79-14 project results. This reconciliation has become our Safety Related Piping Reverification Project (SRPRP). IR 89-024 also reinforced some of the items that had been discussed in the engineering team inspection report and we continued our actions to resolve the deficiencies identified in those areas. The two inspection reports, IR 89-007 and IR 89-024, identified that the IEB 79-14 project did not result in an acceptable product and also identified the need to continue to upgrade our engineering efforts, especially in the area of pipe and pipe support design.

NRC Inspection Report 90-025 presented the results of an inspection conducted during the SGRP from September 19, 1990, through April 18, 1991. Two significant points were made. First, the efforts in the area of design control improved the process controls, but the results of the inspection indicated performance problems still existed. Secondly, our attempts at conveying our expectations to our contractor during the SGRP had not been completely successful. The inspection report identified specific items of non-compliance that were repeat examples of programmatic problems that were identified in previous NRC inspection reports. IR 90-025 also identified that further efforts were needed to control pipe and pipe support analysis.

NRC Inspection Report 91-202 was the result of a special team inspection conducted from June 10 through 21, 1991. NRR was requested to perform this inspection to provide an independent assessment of the technical significance of regional inspection findings regarding analysis of pipe and pipe supports. It validated many of the IR 90-025 findings and also raised some new issues concerning pipe and pipe support design input criteria which required reconciliation.

As a result of IR 90-025 and IR 91-202, we have initiated a number of corrective actions which we believe will achieve our objectives in the area of pipe and pipe support design. These actions include revisions to our FSAR and design specifications, and revisions to certain inputs for our pipe and pipe support analysis. We believe these actions will assure that our SRPRP project and any other future pipe and pipe support design work is accomplished in accordance with a well defined and acceptable design basis. We are also in the process of completing other upgrades to our pipe and pipe support design programs and have increased our staffing levels to provide further assurance that our objectives are accomplished. As we discussed in the October 15, 1991 Enforcement Conference and on previous occasions, our entire pipe and pipe support engineering section was relocated on site and a third party review of all plant initiated pipe and pipe support work is being conducted.

Additionally, an experienced pipe and pipe support analyst was added to the staff.

CONTRACTOR CONTROL

In your January 15, 1992 letter, particular concern was stated with the audits of our SGRP contractor which identified deficiencies that were not adequately addressed. The conclusion was made that this situation existed because of schedule and production pressure. Your letter also states that the management decision to proceed with the project despite having information that design control problems existed, was seriously flawed. That conclusion was based on perceived insufficient consideration for the cumulative significance of the deficiencies and the perception that schedule and production restraints hampered our ability to recognize and take appropriate corrective action.

With the advent of the SGRP in 1989, it was realized that while we believed that we had elevated our engineering and design modification programs to a new level of performance, this level of engineering performance would also need to be achieved by our contractor. Consumers Power Company conveyed these expectations through several meetings with the contractor's management, upgraded design specifications, and generation of a special modification procedure for the project. In addition, we established a program of quality assurance audits that included technical specialist reviews of the contractors engineering. Although we believed our expectations were well understood by our contractor, the results did not meet our expectations.

Consumers Power Company concludes that although schedule and production restraints did exist the root cause of the subject deficiencies was the lack of a clear, concise contractor control program. Several broad initiatives in the area of engineering contractor control are being pursued. The overall objectives of these initiatives are to assure that our performance expectations are expressed to the contractor and not compromised, and that our contractor oversight is sufficient to identify when expectations are not being met so that corrective actions, up to and including work stoppage, can be taken in a timely manner.

MAIN STEAM LINE ANALYSIS

In the October 15, 1991 Enforcement Conference, the violations were discussed as were their causes and corrective action. We stated that none of the identified deficiencies found, as a result of the IR 90-025 or IR 91-202 inspections, required any plant modifications. In conducting a reanalysis of the main steam line, (committed to in our July 9, 1991 letter) we have found some pipe support design discrepancies that do require modification. These pipe support design discrepancies are associated with the SGRP and our contractor's work.

We have determined that although our FSAR criteria were not met, interim operability criteria are met for the piping system design discrepancies. We will be contacting our contractor for an explanation and justification of methods used in calculations for these discrepancies to resolve our concerns. Once we reach resolution on these identified issues, we will review the results and determine if any additional reviews of the work completed by this contractor are needed.

Any modifications to resolve these identified discrepancies are planned to be completed during the 1992 refueling outage.

Attached is our response to each of the violations which were identified during the inspections and described in the January 15, 1992, Notice of Violation and Proposed Imposition of Civil Penalty. Consumers Power Company admits to each of the twenty-four violations. The civil penalty payment was submitted by letter dated February 3, 1992.

Gerald Slade
General Manager

CC: Administrator, Region III, USNRC
Resident Inspector - Palisades

CONSUMERS POWER COMPANY

To the best of my knowledge, information and belief, the contents of this submittal are truthful and complete.

By David P. Hoffman
David P Hoffman, Vice President
Nuclear Operations

Sworn and subscribed to before me this 14 day of February 1992.

LeAnn Morse

LeAnn Morse Notary Public
Van Buren County, Michigan
My commission expires June 6, 1994

[SEAL]

ATTACHMENT

Consumers Power Company
Palisades Plant
Docket 50-255

RESPONSE TO NOTICE OF VIOLATION

February 14, 1992

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

A. *The Palisades Nuclear Power Plant Updated Final Safety Analysis Report (UFSAR), Section 5.7.4.1, "Seismic Analysis of CPCo Design Class 1 Piping," states that the piping systems were analyzed for each horizontal direction combined simultaneously with the vertical direction (absolute sum method).*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Palisades Specification M-195, "Requirements for the Design and Analysis of Palisades Plant Safety Related Piping and Instrument Tubing," Revision 1, dated May 9, 1990, Section 5.10.4.1.2, "Combination of Directional Responses," which implements UFSAR Section 5.7.4.1, specified that when the 1/2% damping curves were used, the vertical and horizontal responses were to be combined using the square root sum of the squares (SRSS) methods. The SRSS method is less conservative than the absolute sum method.

1. <u>Admission or Denial</u>

CPCo admits to the violation,in that the SRSS method was used and the absolute sum method was not.

2. <u>Reasons for the Violation</u>

The reason for the violation is a misunderstanding of the licensing basis. There is no written documentation in the original Palisades Plant commitments clearly specifying either the absolute sum method or the SRSS method. The SRSS method was used exclusively during the work associated with IEB 79-14 and has been used subsequently when the original plant response spectra was employed.

3. <u>Corrective Steps and Results Achieved</u>

Paragraph 5.10.4.1.2 of specification M-195 has been revised to require use of the absolute sum method.

4. <u>Corrective Steps to Avoid Further Violations</u>

A training session was held on October 25, 1991 to identify the use of absolute sum and other changes to Specification M-195.

5. <u>Date When Full Compliance Will be Achieved</u>

Full compliance with the corrective action was achieved with an initiation of an FSAR change, preliminary revision to Specification M-195 on October 22, 1991 and the completion of training on October 25, 1991. (Specification M-195 was preliminary until receipt of an NRC SER on January 30, 1992 which approved use of revised piping stress allowable limits).

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

B. *The Palisades Nuclear Power Plant, UFSAR, Section 5.7.1.3, "Floor Design Response Spectra," stated that floor response spectra peaks for the containment building natural frequencies were widened ±10% to account for variations in soil and structural material properties.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Palisades Specification M-195, "Requirements for the Design and Analysis of Palisades Plant Safety Related Piping and Instrument Tubing," Revision 1, dated May 9, 1990, Attachment 3, "Original Palisades Plant Response Spectra and Building Displacements," documents that the response spectra peaks for the first natural frequencies of the containment were only widened between 6.95% and 7.77% on five of the seven floor elevations. For the second natural frequency of the containment, the response spectra peaks for four of the seven floor elevations were widened less than 10%. For the third natural frequency of the containment internal structure, the peak was not widened for elevation 649 ft.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that response spectra peaks for the containment building natural frequencies were not widened ±10%.

2. <u>Reasons for the Violation</u>

CPCo failed to recognize the FSAR requirement of Section 5.7.1.3 that containment building response spectra were to be broadened by ±10%. This represents a failure to translate FSAR requirements into design specifications. One of the reasons that the FSAR requirement was overlooked was that it was not an original plant licensing criteria and was placed in the FSAR as a requirement in the 1983 FSAR update. The spectra had never been broadened to any specific criteria as the FSAR update claimed. The 1983 FSAR update involved an overall rewrite, and this particular section did not receive adequate discipline review.

3. <u>Corrective Steps and Results Achieved</u>

The spectra were broadened by ±10% in a manner consistent with USNRC Regulatory Guide 1.122 methodology and included in specification M-195, Rev 2, Attachment 3 tables.

4. <u>Corrective Steps to Avoid Further Violations</u>

A training session was held on October 25, 1991 to identify the spectra and other changes to M-195.

5. <u>Date When Full Compliance Will be Achieved</u>

Full compliance with the corrective action was achieved with an initiation of an FSAR change, preliminary revision to Specification M-195 on October 22, 1991 and the completion of training on October 25, 1991. (Specification M-195 was preliminary until receipt of an NRC SER on January 30, 1992 which approved use of revised faulted allowables).

1\. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

C. *The Palisades Nuclear Generating Plant, UFSAR, Section 5.7.2.1, "Containment Building," stated that the results of the final seismic dynamic analyses were shown in Figure 5.7-7, "Containment Building Maximum Seismic Response (OBE)," which gave zero period accelerations (ZPA) values for various elevations in containment.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Palisades Specification M-195, "Requirements for Design and Analysis of Palisades Plant Safety Related Piping and Instrument Tubing," Revision 1, dated May 9, 1990, Attachment 3, "Original Palisades Plant Response Spectra and Building Displacement," specified ZPA values that were less conservative than values listed in the UFSAR. For example, for elevation 590 ft., the ZPA value in the UFSAR Figure 5.7-7, is 0.119, and is 0.100 in M-195, Attachment 3.

1\. <u>Admission or Denial</u>

CPCo admits to the violation, in that specification M-195 specified ZPA values that were less conservative than values listed in the UFSAR.

2\. <u>Reasons for the Violation</u>

The discrepancies resulted when the original response spectra plots were scaled and redrawn. Therefore, this reflects a failure to translate FSAR requirements into design specifications. The plots of response spectra are themselves representations of original response spectra plots which were very difficult to read. The spectra plots in the FSAR were provided as examples rather than strict design requirements. The spectra plots have been removed from the FSAR.

3\. <u>Corrective Steps and Results Achieved</u>

Specification M-195 has been revised to incorporate the original plant response spectra data.

4\. <u>Corrective Steps to Avoid Further Violations</u>

A training program was held on October 25, 1991 to identify response spectra data and other changes to M-195.

5. Date When Full Compliance Will be Achieved

Full compliance with the corrective action was achieved with an initiation of an FSAR change, preliminary revision to Specification M-195 on October 22, 1991 and the completion of training on October 25, 1991. (Specification M-195 was preliminary until receipt of an NRC SER on January 30, 1992 which approved use of revised faulted allowables).

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

D. *The Palisades Nuclear Generating Plant, UFSAR, Section 5.7.4.1, "Seismic Analysis of CPCo Design Class 1 Piping," as implemented by Palisades Specification M-195, "Requirements for the Design and analysis of Palisades Plant Safety Related Piping and Instrument Tubing," Revision 1, dated May 9, 1990, Paragraph 5.10.4.1, "Seismic Inertia," require that for piping systems spanning two or more elevations, the response spectrum curve for the elevation closest to and higher than the center of mass of the piping system be used.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Calculation No. SGRP-PDS-033, "Piping Stress Analysis of Steam Generator E50A Main Steam System, "Revision 1, dated September 6, 1990, and Revision 2, dated January 21, 1991, Paragraph 3.7, "Applicable Seismic Input," used a response spectrum curve for structural elevation 649 which was 16 ft. lower than the center of mass of the piping system.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that the calculation in question used response spectra for structures inside containment which were limited to elevation 649 ft.

2. <u>Reasons for the Violation</u>

Contractor personnel believed that the intent of the FSAR had been met, in that the highest available data was used, and that the analysis was consistent with the original analysis. A calculation was performed to demonstrate that the steam generator could be treated as rigid, thereby supporting the use of elevation 649 ft. data. Thus, the violation was caused by a mistaken belief that the method used satisfied the FSAR requirement.

<u>Corrective Steps and Results Achieved</u>

As a check on the original analysis results, an additional analysis was performed to extrapolate existing plant design seismic spectra from elevation 649 ft. up to the main steam piping center of mass. This work concluded that the original seismic method yielded conservative results in terms of support loads and pipe stresses. The additional analysis was appended to the original calculations and is included in the project [illegible]

4. <u>Corrective Steps to Avoid Further Violations</u>

The time history employed to develop response spectra for the original plant design basis has not been recovered. Therefore, additional spectra for such applications cannot be provided to be consistent with the existing design basis. However, additional spectra for such situations have been generated for the ASME Code Case N-411 method employing the USNRC Regulatory Guide 1.60 spectra. These spectra will be used to address situations in the future where the original plant spectra inventory is incomplete and are contained in specification M-195, Rev 3.

5. <u>Date When Full Compliance Will be Achieved</u>

The additional analysis was completed prior to plant startup on March 15, 1991 and full compliance achieved. Revised calculations ha received an additional independent technical review, which was completed in December 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

E. *Palisades Specification M-195, "Requirements for the Design and Analysis of Palisades Plant Safety Related Piping and Instrument Tubing," Revision 1, dated May 9, 1990, Paragraph 5.10.4.2, "Seismic Anchor Movements (SAM)," specified that the total seismic displacement will be used in the analysis of branch piping.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Calculation SGRP-PD5-033, "Piping Stress Analysis of Steam Generator E50A Main Steam System," Revision 1, dated September 6, 1990, used SAM displacements from structural elevation 649 ft. which neglected the additional SAM displacement from the actual attachment point of the piping system to the steam generator at elevation 677 ft.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that the calculation in question used seismic anchor movements for structures inside containment which were limited to elevation 649 ft.

2. <u>Reasons for the Violation</u>

Contractor personnel believed that the intent of the specification had been met, in that the highest available SAM data was used, coupled with steam generator rigidity, to arrive at SAM displacements at the steam generator nozzle elevation. Thus, the violation was caused by a mistaken belief that the method used satisfied the specification requirement.

3. <u>Corrective Steps and Results Achieved</u>

Additional analysis was performed to account for the increased SAM displacements resulting from an extrapolation of existing plant design seismic spectra from elevation 649 ft. up to the main steam nozzle location (elevation 677 ft.). This additional analysis showed a SAM displacement increase of up to 30%, but also concluded that stresses remained well within allowable limits. The additional analysis is included in project records.

4. <u>Corrective Steps to Avoid Further Violations</u>

It is believed that the linear extrapolation of SAMs to higher elevations is very common practice and should have been employed in this case. However, M-195 has been revised to sort and tabulate SAM data and portray it in such a manner as to ensure correct interpretation and usage.

5. <u>Date When Full Compliance Will be Achieved</u>

The additional analysis was completed prior to plant startup on March 15, 1991 and full compliance achieved. Revised calculations have received an additional independent technical review, which was completed in December 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

F. *Palisades Specification M-195, "Requirements for the Design and Analysis of Palisades Plant Safety Related Piping and Instrument Tubing," Revision 1, dated May 9, 1990, Paragraph 5.10.4.2, "Seismic Anchor Movements (SAM)," specified that individual structure SAM displacements shall be taken from Attachment 4 to M-195 for the Code Case N-411 seismic criteria.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Bechtel Specification No. 20556-G-001P, "Design Criteria Documents for the Palisades Nuclear Plant Steam Generator Replacement," Revision 3, dated October 31, 1990, Paragraph 4.4.2.4.2, "Seismic Anchor Movements," did not include the SAM displacements from Attachment 4 to M-195 for the Code Case N-411 seismic criteria.

1. Admission or Denial

CPCo admits to the violation, in that, at the time of the inspection, Revision 3 of contractor Specification 20557-G-001P did not contain the M-195, Attachment 4 SAM displacements.

2. Reasons for the Violation

The referenced contractor specification utilized plant design data from CPCo Specification M-195, which was revised in May, 1990. Due to questions regarding the new Seismic Anchor Movement (SAM) data of the M-195 revision, final SAM input was not available to the contractor until January, 1991, when resolution was reached between the contractor, SGRP engineers and the plant engineering staff. During the interim, revision of applicable portions of the contractor design specification and final analysis of piping seismic design were held pending resolution of the new SAM data. The contractors engineering procedures clearly required that the Project Engineer "be responsible for assuring the [design] criteria revisions are incorporated in the design (including backfit, if necessary)." The reason for the violation is excessive delay in updating a contractor's design specification and a failure to incorporate design criteria revisions into the design as required.

3. Corrective Steps and Results Achieved

Contractor Specification 20557-G-001P, Revision 4 was issued January 21, 1991 to provide agreement between it and M-195. All analyses that used SAM criteria were reviewed, resulting in few document changes and no hardware alterations.

4. Corrective Steps to Avoid Further Violations

Since this was an isolated occurrence involving interface between the contractor and CPCo on the SGRP, and the SGRP is now complete, corrective steps to prevent recurrence of this specific condition are not warranted. However, M-195 has been revised to make SAM data clear and to indicate how the data should be employed.

5. Date When Full Compliance Will be Achieved

Contractor Specification 20557-G-001P was revised to include consistent SAM data on January 21, 1991. All calculations affected by the revision were reviewed, as required by the contractor's design control program, corrected as necessary, and were completed prior to plant start-up on March 15, 1991. No hardware alterations were necessary.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

G. *The Palisades Nuclear Power Plant, UFSAR, Section 5.10.1.1, "CPCo Design Class 1 Piping," stated that piping was designed to USA Standard B31.1.0-1967, "Power Piping Code (Code)." Paragraph 120.2.4 of the Code requires that for supplementary steel, no modification for allowable stresses for hydrostatic test periods will be permitted.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Palisades Specification C-173, "Technical Requirements for the analysis and Design of Safety related Pipe Supports," Revision 2, dated November 21, 1990, Tables 1.0 and 2.0, specified increased allowables for supplementary steel during hydrostatic test periods.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that Specification C-173 incorrectly specified increased allowables for supplemental steel during hydrostatic test periods.

2. <u>Reasons for the Violation</u>

The reason for the violation is an improper translation of code requirements into the design specification. This reason applies to the development of hydrotest allowables for supplementary steel. Part of the basis for the words in the earlier version of C-173 relate to an interpretation of the meaning of supplementary steel. Supplementary steel per B31.1 has been referred to as building steel (where there is no increase in allowables). What C-173 tended to call supplementary steel was actually hanger steel (where an increase in allowables is warranted). Therefore, the issue is more a problem in wording than in practice. Specification C-173 referred to hanger steel as supplementary steel, which lead to confusion.

3. <u>Corrective Steps and Results Achieved</u>

Specification C-173 has been revised to explicitly characterize separate hydrotest allowables for supplementary steel and hanger steel. The change is consistent with ANSI B31.1 which, in our interpretation, provides no increase in allowables for supplementary steel. The use of the generic multiplication factor (1.5) for standard component support items (catalog items) for hydrotest conditions has been reviewed with vendors and has been judged acceptable. The hydrotest allowable of 1.30 for other hanger support structural steel has been maintained as consistent with ANSI B31.1 requirements. An FSAR change has been initiated to be consistent with the above.

4. Corrective Steps to Avoid Further Violations

Specification C-173 was issued for use on September 20, 1991. A training program was held on October 25, 1991 to identify the difference between supplementary steel and hanger steel, and other changes to Specification C-173.

5. Date When Full Compliance Will be Achieved

Full compliance with the corrective action was achieved with the initiation of the FSAR change, issuance of specification C-173, Rev 3, on September 20, 1991 and with the training session on October 25, 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

H. *The Palisades Nuclear Power Plant, UFSAR, Section 5.10.1.1, "CPCo Design Class 1 Piping," stated that piping was designed to USA Standard B31.1.0-1967, "Power Piping Code." Paragraph 121.2.1 of the Code stated that fixed pipe restraints be structurally suitable to withstand the thrust, movements, and other loads imposed during the [thermal] expansion and contraction of piping.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Palisades Specification C-173, "Technical requirements for the Analysis and Design of Safety Related Pipe Supports," Section 5.4.2, "Friction Load," Revision 1, specified that the existing pipe restraints did not include friction forces caused by the loads due to thermal expansion and contraction of the pipe supports.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that the specification did not contain requirements to include friction forces for existing pipe restraints.

2. <u>Reasons for the Violation</u>

The reason for the violation is a failure to translate code requirements into the design specification. New supports (installations after the January 1989) at Palisades employ thermal expansion loads in determining friction loads as suggested in the statement of the violation. However, this was not done for supports installed prior to January 1989. Discussions relative to this issue focused on which loads were acting "concurrent" with thermal expansion displacement. Clearly, weight loads are always present, but the design thermal load is only present at the end of the thermal expansion cycle.

3. <u>Corrective Steps and Results Achieved</u>

Corrective action was to revise Section 5.4.2 of C-173 to properly reflect the requirements of ANSI B31.1. Specification C-173, Rev 3, was issued for use on September 20, 1991.

4. <u>Corrective Steps to Avoid Further Violations</u>

A training session was held on October 25, 1991 to identify the revision to Section 5.4.2 and other changes to C-173.

5. <u>Date When Full Compliance Will be Achieved</u>

Full compliance was achieved with the issuance of C-173, Rev 3, on September 20, 1992 and with the training session held on October 25, 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

I. *Palisades Specification C-173, "Technical requirements for the Analysis and Design of Safety Related Pipe Supports," Paragraph 5.10.3, "Shear Lugs," Revision 1 specifies that when more than half of the lugs were considered effective, the load was to be assigned based on the relative flexibility of the supporting members.*

Contrary to the above, adequate measures were not established to assure that the design bases were correctly translated into design documents. Specifically, Calculation MSA-PD-EB1-H3, "Pipe Support Design for Main Steam System," Revision 2 dated January 21, 1991, assumed that the restraining forces were equally distributed between the only two lugs (more than half of the lugs) even though the flexibility of the supporting members was different by a factor of two.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that an engineering assumption regarding force distribution at full load was made, but not clearly documented, resulting in support relative flexibility not being determined.

2. <u>Reasons for the Violation</u>

The violation resulted from an engineering judgement that the difference of less than 1/32 inch deflection of the two tube steel sections attached on opposite sides of the stanchion was insignificant at the ultimate load condition, indicating that the two sides would share the loads equally. The judgment was not clearly documented with sufficient justification details in the calculation.

3. <u>Corrective Steps and Results Achieved</u>

The calculation was revised to consider the relative stiffness of each support frame during the application of the design loading, in accordance with the referenced specification.

4. <u>Corrective Steps to Avoid Further Violations</u>

The issue revolved around completing the calculation. In this case, an assumption of a uniform stiffness was made before the finite element results were known. The finite element results showed that the stiffness was not uniform. Therefore, the input assumption should have been adjusted. The completion of the calculation would have been in scaling results by the supporting member stiffness ration. Attention to detail has been highlighted for calculations performed internally and by contractors. It is an ongoing emphasis.

5. <u>Date When Full Compliance Will be Achieved</u>

With the results of recalculation of net deflection based on relative stiffness provided to CPCo on September 20, 1991 full compliance was achieved. The revised calculation has received an additional independent technical review, which was completed in December, 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

J. *Palisades Specification C-173, "Technical Requirements for the Analysis and Design of Safety Related Pipe Support," Paragraph 5.7.1, "Deflection General Requirements," Revision 1, specifies that the total defection of the pipe support shall not exceed 1/16 inch.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Calculation MSA-PD-EB1-H3, "Pipe Support Design for Main Steam System," Revision 2, dated January 21, 1991, failed to recognize that the total deflection of the pipe support exceeded 1/16 inch.

1. <u>Admission or Denial</u>2vsb6T

CPCo admits to the violation, in that the calculation had considered only bending of restraint members, and did not include bending of members attached to the piping.

2. <u>Reasons for the Violation</u>

The violation resulted from judgement that only the bending of the upper members attached to the restraint needed to be evaluated for deflection. The total deflection should have properly included the bending of both upper and lower members in*p1041Xcont8otb a combination, without detailed analysis, appeared to result in total deflection that exceeded the 1/16 inch allowable.

3. <u>Corrective Steps and Results Achieved</u>

The contractor recalculated a net deflection of the two frames. The resulting net deflection is within the allowable.

4. <u>Corrective Steps to Avoid Further Violations</u>

Continuing emphasis is being placed upon the completeness of calculations. The emphasis includes an owner's review of externally generated calculations and an external review of internally generated calculations. A plan for termination of the external review will be made when there is a basis for doing do. In this case, it has been emphasized that support stiffness control is implied by deflection control and that deflection control relates to pipe support deflection through the support to the pipe pressure boundary.

5. <u>Date When Full Compliance Will be Achieved</u>:

With the results of recalculation of net deflection provided to CPCo on September 20, 1991 full compliance was achieved. The revised calculation has received an additional independent technical review, which was completed in December 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

K. *Bechtel Specification No 20557-G-001P, "Design Criteria Documents for Palisades Nuclear Plant Steam Generator Replacement Project," Revision 3, dated October 31, 1990, Paragraph 5.4.17.1.1, "Baseplate Design-General," specified that analyses must account for expansion anchor bolt flexabilities as applicable in Appendix B of the specification.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Calculation MSH-PD-EB1-HE, "Pipe Support Design for Main steam System," Revision 3, dated January 21, 1991, used a flexibility value derived from expansion anchor data which was not applicable to the four through-bolted one inch diameter rods attaching the baseplate to the structure.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that expansion anchor flexibility values were used for calculations including through-bolted rods.

2. <u>Reasons for the Violation</u>

The violation resulted from oversight on the part of the designer in not recognizing that the anchors for this baseplate were comprised of both expansion anchors and through-bolts.

3. <u>Corrective Steps and Results Achieved</u>

Affected calculations have been revised to account for the fact that both expansion anchors and through-bolts were used to attach the baseplates. This reanalysis showed that the baseplate and anchor bolt design (combination of concrete expansion anchors and through-bolts) is acceptable. It should be noted that the bolts on this baseplate are primarily loaded in shear, so the tension stiffness had very little effect on the acceptability of the design, especially considering the thickness of the baseplate.

4. <u>Corrective Steps to Avoid Further Violations</u>

Continuing emphasis is being placed upon the completeness of calculations. The emphasis includes an owners review of externally generated calculations and an external review of internally generated calculations. A plan for termination of the external review will be made when there is a basis for doing so.

5. <u>Date When Full Compliance Will be Achieved</u>

With the revised calculations provided to CPCo on September 20, 1991 full compliance was achieved. Revised calculations have received an additional independent technical review, which was completed in December, 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

L. *Bechtel Specification No. 20557-G-001P, "Design Criteria Documents for Palisades Nuclear Plant Steam Generator Replacement Project," Revision 3, Paragraph 4.4.1.4, "Stress Intensification Factors," specified that piping analysis should use the applicable ANSI B31.1 stress intensification factors. The ANSI B31.1 stress intensification factor (SIF) equation, taken from 1973 Edition with Summer of 1973 Addenda, stated that it was applicable only if certain field installation conditions were met.*

Contrary to the above, Calculation SGRP-PDS-003, "Pipe Stress Analysis of Steam Generator E50A Blowdown Piping," Revision 5, dated August 21, 1990, utilized the ANSI B31.1 Code equation to calculate SIFs for several branch connections but did not specify nor verify that the Code specified conditions were met.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that improper SIFs for several branch connections were used.

2. <u>Reasons for the Violation</u>

The violation resulted from contractor belief that assuring proper construction techniques were sufficient to satisfy ANSI B31.1 Code restrictions, without specifically verifying dimensional constraints. Licensee review of contractor documents also failed to identify this discrepancy.

3. <u>Corrective Steps and Results Achieved</u>

The contractor completed re-analysis of affected calculations using SIF derived from the branch connection manufacturer's recommendations. The new SIF was 37% greater than that originally used, however, there was sufficient margin in the original design to accommodate the increase without exceeding allowable stresses.

4. <u>Corrective Steps to Avoid Further Violations</u>

Emphasis has been placed on procedures and specifications to conduct field inspection of "as-built" designs. New criteria for field installation to include new tolerances have emphasized the relationship between as built details and design calculations.

5. <u>Date When Full Compliance Will be Achieved</u>

Full compliance was achieved when revisions to affected calculations were completed prior to plant startup on March 15, 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

M. *The Palisades Nuclear Power Plant UFSAR, Section 5.10.1.2, stated that pipe supports were designed using the criteria of the American Institute of Steel Construction (AISC) Specification, Seventh Edition, 1970. Part 4 of the AISC Specification for prequalified welded joints stated that fillet welds for skewed T-joints were limited to a minimum of 60° and that for angles less than 60°, the weld was considered a partial penetration groove weld.*

Contrary to the above, adequate measures were not established to assure that the design bases were correctly translated into design documents. Specifically, for Drawing No. M101-6010, "Pipe Support Number SGAB-PD-H9," Revision 3, dated November 10, 1990. Field Change Notice No. 293 resulted in a skewed T-joint weld angle of approximately 49° and the affected portion of the weld was not changed from a fillet weld to a partial penetration groove weld.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that the wrong weld was specified.

2. <u>Reasons for the Violation</u>

The violation resulted from oversight on the part of originator and reviewer of the Field Change, in that they failed to note the change would result in an angle of less than 60 degrees. The change was necessary due to an interference problem on the hanger requiring a change to the angle of the brace member. In reviewing the change, the designer failed to consider the minimum angle limit for fillet versus groove welds. This determination is normally the output of computer analysis, but review of the requested 5.5" change did not include new computer analysis.

3. <u>Corrective Steps and Results Achieved</u>

The affected drawing was corrected upon discovery of the drafting error. The weld was verified to have been correctly made. Welder qualifications were reviewed and it was found that welders were properly qualified for both fillet and groove welds. The contractor reviewed all hanger drawings for the SGRP and found two other cases where a weld symbol should have been revised. These were also corrected.

4. Corrective Steps to Avoid Further Violations

The plant modification control procedures require that all engineering design changes be initiated by the project engineer or the discipline engineer who initiated the design. This assures that design changes will receive adequate technical review commensurate with the original design.

5. Date When Full Compliance Will be Achieved

Full compliance was achieved when all hanger drawings were reviewed and corrected prior to plant startup on March 15, 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

N. *The Palisades Nuclear Power Plant UFSAR, Section 5.7.4, "Seismic Analysis of CPCo Design Class 1 Piping," stated that use of the higher damping values, specified in the American Society of Mechanical Engineers (ASME) Section III, Code Case N-411, required adherence to the conditions specified in Regulatory Guide 1.84, Revision 24. Regulatory Guide 1.84, Revision 24, included the condition that analyses using these damping values had to employ current seismic spectra and procedure. The current Standard Review Plan, NUREG-0800, Revision 2, 1981, stated that seismic analysis of equipment supported at two or more locations required the use of the upper bound envelope of the spectra at all support attachment points.*

Contrary to the above, adequate measures were not established to assure the design bases were correctly translated into design documents. Specifically, Calculation SGRP-PDS-002, "Pipe Stress Analysis of Steam Generator E50B, Recirculation Piping Inside Containment," Revision 8, January 10, 1991, did not use upper bound envelope seismic response spectra values in that it utilized spectra from elevation 649 ft. when the highest structural attachment point was on the steam generator at elevation 661 ft.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that the original analysis used data from elevations below 661 ft., coupled with the rigid body assumption used and substantiated elsewhere, to develop response spectra.

2. <u>Reasons for the Violation</u>

Contractor personnel believed that the intent of the FSAR had been met, in that the highest available data was used, and that the analysis was consistent with the original analysis. A calculation was performed to demonstrate that the steam generator could be treated as rigid, thereby supporting the use of elevation 649 ft. data. Thus the violation was caused by a mistaken belief that the method used satisfied the FSAR requirement.

3. <u>Corrective Steps and Results Achieved</u>

Analysis was performed to extrapolate existing plant design seismic spectra from available locations up to the recirculation nozzle location (elevation 661 ft.). These new "enveloped" floor response spectra curves did not vary significantly from the curves used in the original design work, and review concluded there would be no recirculation piping system changes required, and only insignificant differences in the forces and reactions that had been calculated.

4. <u>Corrective Steps to Avoid Further Violations</u>

Additional response spectra have recently been generated for implementation of Code Case N-411 and are included in Specification M-195. Additional spectra can be generated when the building model and time history exist. The plant staff has been advised through recent training that there is never a need to use an inappropriate response spectra and that a project specific spectra can be employed when necessary.

5. <u>Date When Full Compliance Will be Achieved</u>

Full compliance was achieved when reanalysis was completed prior to plant startup on March 15, 1991.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

O. *Bechtel Specification No. 20557-G-001P, "Design Criteria for Palisades Nuclear Plant Steam Generator Replacement Project,"Revision 3, dated October 31, 1990, Table B-4, as referenced in Paragraph 5.4.17.3.1 of the specification for capacity reduction due to shear cone overlap, stated that, if the spacing was smaller than specified, the allowable anchor bolt design capacity shall be reduced in proportion to the ratio for the spacing provided to the spacing required.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Calculation SGRP-PD-H14, "Pipe Support Design for Steam Generator E50B Blowdown," Revision 2, dated January 31, 1991, failed to evaluate the allowable anchor bolt design capacity when the installed configuration had a spacing smaller than specified.

Also, contrary to the above, Revision 3, dated March 1, 1991 of the above listed calculation, did not reduce the anchor bolt capacity by the ratio of the spacing provided to the spacing required, but instead used a methodology based on "reserved" concrete concept which had no previously established basis.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that there was a failure to evaluate the allowable anchor bolt design capacity when the installed configuration had a spacing smaller than specified and used a methodology based on the "reserved" concrete concept which had no previously established basis.

2. <u>Reasons for the Violation</u>

This violation resulted from the designer not adhering to specification requirements and from judgment that the usual method of evaluating anchor bolt spacing would not provide meaningful results for the cases where more than one type of anchor was included in the pattern, or where the shear cone of one type of bolt was contained largely within the cone of another.

3. <u>Corrective Steps and Results Achieved</u>

The resolution of the concern with the missing evaluation of bolt spacing was achieved when the contractor provided the necessary analysis of bolt spacing required by the design specification.

The rational for the validity of analytical technique was presented to NRR for review during the project. NRR responded with a letter on June 13, 1991 requesting the contractor to provide additional information to substantiate the validity of the method used. The contractor prepared a response which was submitted in November, 1991.

4. <u>Corrective Steps to Avoid Further Violations</u>

The issue relates to the use of ACI 349 methodology on a DRILLCO bolt pattern. The Plant does not intend to prepare a procedure for installation of DRILLCO bolts until the cone overlap issue is resolved (i.e. DRILLCO bolts will not be used until the issue is resolved).

5. <u>Date When Full Compliance Will be Achieved</u>

Pending resolution of the methodology concern, CPCo considers that the anchor bolt design done for the Palisades SGRP is acceptable, and provides conservative results according to ACI 349.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

P. *Palisades Administrative Procedure No. 9.11, "Engineering analysis," Revision 4, dated December 28, 1989, Paragraph 6.4.2.b, "Detailed Technical Reviews," stated that detailed review shall verify the accuracy, completeness, and adequacy of the engineering analysis.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, the detailed technical review performed for Calculation EA-SC-90-083-01, "Change K-8 Turbine to Class II (675 psi/650°F)," Revision 2, dated November 27, 1990, did not consider the effects of the additional moments caused by the addition of an eccentric reducer nor the effect on the stress intensification factor for the eccentric reducer which was not defined in the piping design Code.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that the effects of the eccentric reducer were not considered in the calculation.

2. <u>Reasons for the Violation</u>

The reason for the violation was an undocumented engineering judgment contributed to by the inexperience of the individuals involved.

3. <u>Corrective Steps and Results Achieved</u>

Immediate corrective action involved an engineering review of the eccentric reducer issue with regard to the component stress intensification factor (SIF) and system response. The documented result of the review was that the configuration was acceptable.

Corrective action also has been the establishment of the NECO Mechanical and Civil/Structural Engineering Department under whose auspices future pipe and pipe support analysis will be conducted.

4. <u>Corrective Steps to Avoid Further Violations</u>

The engineering organization is currently in place at the site. In addition, training was provided to focus on this discrepancy and related code issues.

5. Date When Full Compliance Will be Achieved

The engineering organization has been in place since mid-1991. The training was offered on January 23 and 24, 1992.

Full compliance was achieved upon completion of documented engineering review completed on December 12, 1990.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design control measures shall provide for verifying or checking the adequacy of design.*

Q. *Palisades Specification C-173, "Technical Requirements for the Analysis and Design of Safety Related Pipe Supports," Revision 1, Paragraph 5.11.5, "Rod Hangers," required that when double rod hangers were used on a vertical riser pipe, the hanger components and supporting structures were to be designed to take the total design load on one side.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, Calculation EA-03340-HC12-H1, "Safeguards Room Containment Sump Drains Support Package," Revision 3, dated May 28, 1990, for a double rod hanger on a vertical riser pipe, evaluated the hanger components and supporting structures with half of the total design load on each side.

1. Admission or Denial

CPCo admits to the violation, in that the hanger components and supporting structures were evaluated using only half of the total design load on each side.

2. Reasons for the Violation

The EA-03340-HC12-H1 calculation error was a personal performance issue both on the part of the performer of the calculation and the reviewer of the calculation. The specification requirements were clear. Part of the reason for the violation stemmed from revising the original calculation (IEB 79-14 vintage), which was incorrect, rather than redo the entire calculation.

3. Corrective Steps and Results Achieved

A review was conducted of all the work of the originator and reviewer of the subject support calculation in order to determine if similar deficiencies existed elsewhere. It was concluded the calculation error was an isolated incident. Calculation EA-03340-HC12-H1 was revised and the hanger reworked.

4. Corrective Steps to Avoid Further Violations

It has been emphasized that IEB 79-14 vintage calculations shall be redone rather than revised. This emphasis on reanalysis rather than revision of those calculations is expected to limit the propagation of existing errors.

5. Date When Full Compliance Will be Achieved

Full implementation of the corrective action was achieved with the modification of the hanger completed prior to startup from the 1990-1991 refueling outage.

I. *10 CFR Part 50, Appendix B, Criterion III, required, in part, that measures be established to assure that regulatory requirements and design bases are correctly translated into design documents. Also, design Control measures shall provide for verifying or checking the adequacy of design.*

R. *The Palisades Nuclear Power Plant UFSAR, Section 5.10.1.1, "CPCo Design Class 1 Piping," stated that piping was designed to USA Standard B31.1.9-1967, "Power Piping Code." Paragraph 127.4.8(c) of the Code stated that branch connections which abut the outside surface of the run wall shall be attached by means of full penetration welds.*

Contrary to the above, adequate measures were not established to assure that design bases were correctly translated into design documents. Specifically, instruction given to the welder on Repair Inspection Checklists for welds No. 1 and No. 10 on Drawing 24804973, dated August 23, 1988, and welds No. 1 and No. 14, on Drawing 24804972, dated August 27, 1988, specified attachment welds for all four branch connection as fillet welds. Fillet welds are not full penetration welds.

1. <u>Admission or Denial</u>:

CPCo admits the violation, in that the weld was incorrectly specified on the Repair Inspection Checklist.

2. <u>Reasons for the Violation</u>:

This deficiency resulted from a lack of an adequate welding specification and control program.

3. <u>Corrective Steps and Results Achieved</u>:

The four welds were verified as full penetration welds. Two of the welds required repair which was completed.

4. <u>Corrective Steps to Avoid Further Violations</u>:

The item was identified as NRC Unresolved Item 89007-05. In the Inspection Report 89007 many examples of problems were identified with the plant's welding design and specification program. As a result many changes in the program were made and were identified in our responses to the inspection report.

Corrective actions in the area of welding and welding program controls were identified in our letters dated August 10, 1989, and December 28, 1989, which responded to the Notice of Violations cited in the NRC's June 28, 1989, Inspection Report and Notice of Violation.

Based upon the corrective actions taken in the area of welding in response to the NRC's Inspection Report 89-007 no additional corrective actions are required as a result of this occurrence.

5. <u>Date When Full Compliance Will be Achieved</u>:

Full compliance was achieved with the revisions to the welding program identified in our letters dated August 10, 1989, and December 28, 1989.

II. *10 CFR Part 50, Appendix B, Criterion V, required in part, that activities affecting quality shall be accomplished in accordance with prescribed instructions and procedures.*

A. *Palisades Administrative Procedure 3.03, "Corrective Action," Revision 4, October 8, 1988, Paragraph 6.5, "Completion of Corrective Actions," stated that if the corrective action taken differs from the proposed action specified by the Plant Review Committee (PRC), the event report shall be returned to the PRC for concurrence.*

Contrary to the above, the corrective actions taken on December 27, 1990, for Event Report No. E-PAL-89-030P, in accordance with the licensee's response to the NRC dated December 18, 1989, differed from the actions specified by the PRC and the event report was not returned to the PRC for concurrence. Specifically, the proposed corrective action specified internal visual verification that four welds were full penetration welds, and the actual corrective action consisted of a documentation review and interviews with welding supervisors.

1. <u>Admission or Denial</u>:

CPCo admits to the violation, in that the corrective action was different from that specified in the response to the NRC dated December 18, 1989 were taken.

2. <u>Reasons for the Violation</u>:

The CPCo document which controlled the implementation of the corrective action, was not updated to reflect the revised corrective actions described in December 18, 1989 letter to the NRC. Therefore, the action taken to verify the welds was not the same as in the letter to the NRC. No system or control mechanism existed to require a verification of parallel corrective actions for situations as described above.

3. <u>Corrective Steps and Results Achieved</u>:

Our commitment tracking system has been reviewed to assure that any corrective actions affected by Licensing submittals will be revised to align with the submittals.

4. <u>Corrective Steps to Avoid Further Violations</u>:

Guidance has been given to the commitment tracking system coordinator to review all future corrective action document references to assure that the assigned action agrees with the proposed corrective action. If the actions differ, a new action will be generated to complete the action as stated in the licensing submittal. In addition, when commitments are closed and a corrective action document is referenced, the commitment tracking system coordinator verifies that the action completed agrees with the commitment which was made.

5. <u>Date When Full Compliance Will be Achieved</u>:

Full compliance has been achieved with these commitment tracking reviews.

II. *10 CFR Part 50, Appendix B, Criterion V, required in part, that activities affecting quality shall be accomplished in accordance with prescribed instructions and procedures.*

B. *Palisades Administrative Procedure 3.07, "Safety Evaluations," Revision 4, dated January 23, 1990, Paragraph 5.2.4, required that when answering each Safety Review Question, the Preparer list in the safety evaluation FSAR sections affected by the item under review.*

Contrary to the above, in Safety Review, PS&L Log No. 90-0797, "Main Steam System," FC-911, Revision 0, dated September 28, 1990, the preparer did not list UFSAR Section 5.7.4, "Seismic Analysis of CPCo Design Class 1 Piping," and consequently failed to note that UFSAR Section 5.7.4.1 and Figure 5.7-27, were directly affected by this change to the facility.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that the noted FSAR Sections 5.7.4, 5.7.4.1 and Figure 5.7-27 were not listed in the Safety Review.

2. <u>Reasons for the Violation</u>

The violation resulted from oversight by the preparer and reviewer of the Safety Review. The preparer was aware that the changes to the main steam line had been determined not to affect the seismic qualification, and did not examine that section of the FSAR for references to the main steam line. The section and figure affected were examples of seismic and stress analysis methodology, which happened to use the main steam line.

3. <u>Corrective Steps and Results Achieved</u>

Both references to the main steam line have been removed from the FSAR, consistent with an effort to delete unnecessary and redundant information. The affected safety evaluation has been annotated to include the above sections and figure.

4. <u>Corrective Steps to Avoid Further Violations</u>

A final review of the FSAR was performed at the conclusion of the SGRP to assure that all SGRP-related information was appropriately updated. Safety evaluation trainers were made aware of this occurrence so that the continuous training program will address the occurrence. In addition, the administrative procedures governing 50.59 evaluations were revised to inform personnel of the limitations of the electronic text search techniques.

5. <u>Date When Full Compliance Will be Achieved</u>

Full compliance was achieved on March 28, 1991 with the initiation of the FSAR change request to remove the unnecessary FSAR references.

III. *10 CFR Part 50, Appendix B, Criterion XVI, required in part, that measures be established to assure that nonconformances were promptly identified and corrected.*

A. *Contrary to the above, the established measures were insufficient to assure that non conformances were promptly identified and corrected that the action taken on December 27, 1990, to resolve Event Report E-PAL-89-030P failed to include proper verification of Weld No. 14 on Drawing 24804972 and Weld No. 1 on Drawing 24804973 which were subsequently found to be nonconforming welds. Specifically, the licensee did not verify full weld penetration before closing out the event report.*

1. **Admission or Denial**:

CPCo admits to the violation in that the welds were not verified before closing out the event report.

2. **Reasons for the Violation**:

Failure to perform an appropriate inspection to verify that the welds were full penetration welds.

3. **Corrective Steps and Results Achieved**:

The welds were radiographed and shown to be full penetration welds. (Based on the results of the radiograph the welds were repaired.)

4. **Corrective Steps to Avoid Further Violations**:

Corrective actions in the area of welding and welding program controls identified in CPCo's letters to the NRC dated August 10, 1989, and December 28, 1989 provided assurance that this violation will not reoccur.

5. **Date When Full Compliance Will be Achieved**:

Full compliance was achieved when the welds were repaired during the 1990/1991 Refueling Outage.

III. *10 CFR Part 50, Appendix B, Criterion XVI, required in part, that measures be established to assure that nonconformances were promptly identified and corrected.*

B. *Contrary to the above, during a maintenance outage in May 1990, the licensee identified a leaking weld in the containment spray header, which constituted a nonconformance to the American Society of Mechanical Engineer, Section XI, 1983 Edition, IWA 5250, "Corrective Measures," and failed to assure the nonconformance was promptly corrected. Specifically, the licensee returned the reactor to power with the weld in a nonconforming condition, and did not correct the leaking weld until approximately four months later.*

1. Admission or Denial:

CPCo admits to the violation, in that the leaking weld was not repaired prior to returning the reactor to power.

2. Reasons for the Violation:

The cause of this event was a failure to identify that through wall leakage in an ASME class piping system is not allowed by the code.

3. Corrective Steps and Results Achieved:

The defective weld on the containment spray line (HC-44-8) was repaired and an evaluation of other welds on the containment spray lines was conducted. Six other spray header welds were dye penetrant tested at structural discontinuities with all examination results acceptable.

4. Corrective Steps to Avoid Further Violations:

An overview of this occurrence was sent to plant management, engineering, maintenance and operations planners, shift supervisors and shift engineers on September 19, 1991.

5. Date When Full Compliance Will be Achieved:

Full compliance was achieved during the Steam Generator Replacement outage with the repair of the weld.

III. *10 CFR Part 50, Appendix B, Criterion XVI, required in part, that measures be established to assure that nonconformances were promptly identified and corrected.*

C. *Contrary to the above, corrective action taken in response to Palisades Quality Assurance (QA) Audits SGRP-SV-90-A1 and SGRP-SV-90-A2 conducted in February 1990 and July 1990 respectively, did not correct the identified design control program deficiencies in that same types of design control deficiencies continued to be identified as documented in the Palisades QA Audit SGRP-SV-91-A1 conducted in January and February 1991. Specifically, QA Audit SGRP-SV-91-A1 documented over 100 comments, questions or concerns as examples of failing to meet ANSI N45.2.11 QA requirements for design of nuclear power plants.*

1. Admission or Denial

CPCo admits to the violation, in that, design control deficiencies continued until the end of the project, despite being identified in earlier audit reports.

2. Reasons for the Violation

The violation resulted from contractor and project management judgement that the findings from 1990 audits were not technically or safety significant, and the belief that corrective actions taken in response to those audits would prevent recurrence, or locate and correct such problems as had been found before final acceptance of the work.

3. Corrective Steps and Results Achieved

All conditions identified in the three cited QA audit reports were corrected by the contractor, with the correction verified by the subsequent QA reviews. Necessary corrections to support plant start-up were completed prior to March 15, 1991. At the time this issue was raised on the project, all installation was complete, corrective actions for most audit deficiencies identified in audit SGRP-SV-91-A1 were completed, and final closeout reviews and document package assembly was ongoing. Deficiencies not affecting startup were closed by May 6, 1991.

4. Corrective Steps to Avoid Further Violations

Several broad initiatives in the area of engineering contractor control are being pursued. The overall objectives of these initiatives are to assure that our performance expectations are expressed to the contractor, not compromised, and that our contractor oversight is sufficient to identify when expectations are not being met so that corrective actions, up to and including work stoppage, can be taken in a timely manner.

5. Date When Full Compliance Will be Achieved

Full compliance with the individual identified discrepancies were achieved as discussed in the response to item 3 above.

IV. *10 CFR Part 50.59, "Changes, Tests and Experiments," stated that licensees my make changes to the facility as described in the safety analysis report without prior Commission approval unless the proposed change involves an unreviewed safety question, including a reduction in the margin of safety defined in the basis for any technical specification.*

Contrary to the above, in the change to the Final Safety Analysis Report (FSAR), dated October 24, 1980, the licensee reduced the margin of safety inherent in the original seismic design basis discussed in Palisades Technical Specification Paragraph 4.16 by increasing the allowable stress value for certain piping from 1.1S_y to 2.4S_h without prior NRC approval and has used this increased stress allowable in all piping analyses since that time.

1. <u>Admission or Denial</u>

CPCo admits to the violation, in that revised interim criteria was used which had not been approved by the NRC for long term use.

2. <u>Reasons for the Violation</u>

The reason for the violation was the CPCo assumption in 1980 that use of the 2.4S_h faulted stress allowable was acceptable to the NRC for long term rather than interim use.

3. <u>Corrective Steps and Results Achieved</u>

The immediate corrective action involved an August 7, 1991 meeting and an August 15, 1991 telecon with the NRC Staff to develop an agreement for the use of faulted pipe stress allowables at Palisades. Subsequently an FSAR revision was proposed and transmitted to the Staff for their approval. Current piping analyses (as well as M-195, Revision 2) were held as preliminary pending approval of the proposed FSAR change by the NRC. An SER was received via NRC letter of January 30, 1992.

4. <u>Corrective Steps to Avoid Further Violations</u>

Corrective steps to prevent recurrence center on attempting to achieve a Palisades Plant and NRC Staff communication which will eliminate such misunderstandings in the future. The communication will focus on developing an understanding as to when an SER is required from the NRC on these and similar technical considerations. Also the present rigor that is involved with our 10 CFR 50.59 review process will help in identifying changes that are beyond the plant design basis and, therefore, require NRC approval to implement them.

5. <u>Date When Full Compliance Will be Achieved</u>

The immediate corrective action was achieved with the submittal of the FSAR change proposal. Full compliance was achieved on January 30, 1992 with issuance of the SER. Further dialogue between the Palisades Plant and the NRC to prevent recurrence is ongoing.